OUR ASTRONOMICAL COLUMN.

The Andromedes.—As regards the return of the Andromedes, there is every reason to believe that by this time the shower will have passed by the earth's orbit. Brilliant displays were observed in 1872 and 1885, on November 27 in each year; and it would naturally be inferred that on the same day of the present year, which corresponds to an equal interval of time, a like occurrence should take place In 1892, however, the earth passed through this stream on November 23, and it has been computed that this recession of the node was caused by the perturbations of Jupiter, which were responsible for this difference of four days. If the observations made on the 23rd have indicated that this date is somewhat too early, observers should be careful to watch on the following nights, for, after all, the exact time of reappearance cannot be definitely foretold. The radiant point of this shower is in Andromeda (25° + 43°), and, therefore, at this time of the year at a great altitude. Unlike the Leonids they move slowly, as they have to overtake the earth in her movement round the sun.

A close watch on the night of the 22nd was kept at the Solar Physics Observatory, South Kensington; but the usual fog made its appearance at about 9 p.m., and became thicker towards midnight. Altogether *three* meteors were seen between 8.30 p.m. and 12.15 a.m., but none of these were Andromedes.

The Planet Jupiter.—The markings on Jupiter, which are involved in the dense atmosphere around him, have been subjected to minute observations for many years, and it is now that we are beginning to learn something of the circulation in operation on that planet. That the atmosphere does not rotate homogeneously has for many years been known, and the movement of the great red spot may be given as an instance of this irregularity. Mr. Stanley Williams, a faithful observer of Jupiter, showed clearly in 1888 that there existed a swift southern current which extended from latitude − 37° to − 55°. In a more recent communication (*Astr. Nach.*, No. 3528) he has published the results of observations of two southern spots within this zone which were visible, one in 1890 and the other two years later. The object of these observations was to investigate whether such a current is a permanent feature of the planet or not, and to trace from year to year the variations that may occur in the velocity of its motion.

Without entering into the details which are given in his article, we will limit ourselves simply to his results. The following table shows the periods of rotation obtained, the first being an observation by Prof. C. A. Young in 1886 of a small white spot in latitude 50° south.

Year.	Limit of lat.	Rot. period.		
		h.	m.	s.
1886	− 50°	9	55	11·1
1888	− 37° to − 55°			0·9
1890	− 36° to − 45°			6·7
1892	− 32° to − 39°			8·4

A glance at the figures in the last column shows that this southern current is not only a permanent feature of the planet, but that its velocity is not constant. As regards the limit of the zone in which this current exists, we are told that the current may extend further southwards, and perhaps even to the pole itself.

We hope that Mr. Stanley Williams will continue his observations in this region, and settle this question of limit, which is important in the light of the general atmospheric circulation of this planet.

The Perseids of 1898.—In August last the weather was so favourable that at a great number of places observations of the Perseids were successfully made. A not unimportant feature of the display was the large number of meteors that did not radiate from Perseus at all, and this fact is very clearly brought out in the description and chart of the observations made by Messrs. Vacca and Senouque on the nights of the 10th to the 16th (*Bull. Soc. Astronomique de France* for November). It must be mentioned that at Paris, where these observations were made, the night of the 10th was not very clear; so the majority of the observations were made on the following nights.

An examination of the diagram shows several distinct radiant points, not only in Perseus, but in Cassiopeia, Cygnus, and the Great Bear.

Another set of interesting observations, made by M. Fournier, is published in the same journal, and contains also a reproduction of a chart, showing the trails recorded. This, however, is restricted to the night of the 10th, which was beautifully clear at the place of observation, and the chief radiant point deduced is well defined near η Persei. Out of sixty meteors observed, thirty-nine were Perseids, five or six sporadic, and some others apparently radiating from Cassiopeia.

Astronomical Society of Wales.—The last two monthly numbers of this Society's publication, the *Cambrian Natural Observer*, show that interest in astronomical phenomena is by no means at a low ebb, but rather verging on a spring tide. The October number contains some interesting notes about Gruithuisen, who was for some time editor of the *Jahrbuch*. His great speciality was a study of the lunar features; and although ridiculed, he was nevertheless "an assiduous and careful observer." Mr. Denning contributes some notes on meteoric fireballs, and describes how observations should be recorded. He gives, also, the right and the wrong way of recording them, or rather, we should say, the useful and the useless, from published examples, and we cannot help quoting them as guides to future recorders.

"On June 10, 1891, I saw a beautiful phenomenon. Suddenly at the zenith, east of the Great Bear, shone forth a yellow globe like Venus at her brightest. Dropping, somewhat slowly, it fell obliquely southwards. As it passed in its brilliant career, it lighted up its dusky path with a glorious lustre. When it had descended about half-way down towards the horizon, it burst into a sparkling host of glorious fragments, each dazzlingly shot over with all the hues of the rainbow."

The useful record was as follows:—

Date and time.—1892 December 12, 11h. 22m. G.M.T.
Object.—Fine meteor, nearly = Jupiter.
Path.—55° + 41° to 45° + 20°; length 22°.
Duration of flight.—1·2 seconds.
Colour.—Bluish-white.
Appearance.—Brightest in latter portion of its path, where it left a white streak for about one second.
Probable radiant.—ϵ Ursae Majoris.

The November number is especially a "meteor" number, and contains information on the observation of these bodies by Denning, Johnstone Stoney, Carslake Thompson, &c.

Photographic Plates and the Spectrum.—In laboratories and observatories where a study is made of gaseous and metallic spectra by the aid of photography, it is important to make use of the differences between the sensitiveness of the numerous photographic plates which are obtainable. For that particular part of the spectrum which may be under investigation, it is always desirable to employ the greatest photographic action possible, and this can only be done by preparing plates which are most sensitive to this region. A very interesting comparison of the sensitiveness of various plates for the different regions in the spectrum is given by Mr. E. Sanger Shepherd (*Journal of the Camera Club*, vol. xii. No. 150), in an article on the photographic reproduction of paintings; and curves are added, showing clearly how each of the plates behave.

Comparing the Cadet spectrum plate and the Ilford chromatic plate, the former gives action beyond the D line, whereas the latter ceases at the D line; there is very little red sensitiveness, which is perhaps the worst feature of the plate, and there is a gap in the green. Lumière's panchromatic plate has extreme red sensitiveness; but except for a small gap, in the green it is sensitive all through the spectrum. In Lumière's "B" plate the sensitiveness in the red is very considerable and more extensive than in the plate preceding, but there is a very long gap in the green. Edward's snap-shot isochromatic plates have considerable sensitiveness in the green and yellow, and a little less in the red; the curve is here much smoother, and not subject to such great changes.

In the Cadet lightning spectrum plate we have extreme sensitiveness from the blue to the yellow, and yet sufficient red sensitiveness for many purposes. Considering the whole spectrum, it seems to be the best plate for uniformity throughout, and the small gap in the extreme red makes it possible to use a considerable amount of light for developing.

Although it is not absolutely necessary, it is always more convenient to develop in a room lighted sufficiently to see how the image appears. Many photographers do not pay sufficient attention to the purity and colour of light that is admitted. The gaps in the sensitive curves point out clearly those rays which have least action on the plate, and which should therefore be

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used as light filters. Thus for Lumière's "B" plates we must have a bright chromium green, a deep pot-green glass, together with aurantia; while for Lumière's "A," we should use a red light consisting, for instance, of aurantia, naphthol yellow and fuchsin films. For Thomas's plates a faint green or a fairly bright red glass with a strong tint of aurantia dye might be employed. Edward's snap-shot isochromatic and rapid spectrum plates require the quality of the filter light to be very pure.

THE CHEMICAL SOCIETY'S BANQUET TO PAST-PRESIDENTS.

REFERENCE has already been made to the banquet given on November 11 to Sir J. Henry Gilbert, Sir Edward Frankland, K.C.B., Prof. W. Odling, Sir Frederick Abel, Bart., K.C.B., Prof. A. W. Williamson, and Dr. J. H. Gladstone, Past-Presidents of the Chemical Society, who have been Fellows of the Society for fifty years or more. The idea of expressing in this way the high regard in which men of science hold the work of these distinguished chemists was an excellent one, and it was well carried out. The large number of congratulatory telegrams and communications received on the day of the banquet from every country where the science of chemistry is cultivated showed that the whole civilised world was in sympathy with the object of the banquet. Communications were received from France, Holland, Belgium, Germany, Sweden, Russia, Austria, the United States, and several other countries. Prof. Friedel wrote: "I should have been happy to associate myself with the Chemical Society in doing honour to these veterans of science. I have the honour to be the friend of most of them, and the beneficent action they have exerted on Chemical Science cannot be esteemed too highly. They form the finest phalanx of the Fathers of our science which exists in any country. With these sentiments you will understand the liveliness of my regret to be able to take part from afar and in spirit only in the honour paid them." At a meeting of the Russian Chemical Society the following was passed: "That the Society avail itself of the exceptional opportunity of being able to congratulate conjointly Sir Joseph Henry Gilbert, Sir Edward Frankland, Prof. Odling, Sir F. A. Abel, Dr. A. W. Williamson, and Dr. J. H. Gladstone, whose distinguished services during half a century stand out as a model for all investigators in chemical science, and also express the wish to see the further results of their labours in the annals of science for many years to come." A telegram from the German Chemical Society contained the message: "The sister Society sends both Jubilee congratulations and greetings to the Jubilee celebration of the Presidents of the Chemical Society, Gilbert, Frankland, Odling, Abel, Williamson, and Gladstone." These messages show that the distinguished men to whom the banquet was offered are held in the highest esteem in all places where chemical studies are carried on.

We regret that the limitations of space will not permit us to print the speech in which the President, Prof. Dewar, who occupied the chair at the banquet, alluded to the work of the six Past-Presidents, nor can we find room for any speeches other than those in which these distinguished men replied to the toast in their honour.

Sir J. Henry Gilbert said:—"After the extremely flattering and eloquent terms in which our President has referred to the work of the six Past-Presidents of the Society who are so highly honoured to-night, it is surely a difficult task to say anything in response. I feel that any words of mine would be entirely inadequate; and I must, I think, fall back on what I was intending to say, and give a little personal history of the early times of the Society. You are aware, most of you, that I am to night in the position of the senior of the Past-Presidents, in consequence of the death of Lord Playfair. He was, as you know, one of the founders of the Society, and, before he died, the only survivor of those founders. I myself came in within three months of the foundation, and so had some knowledge of the Society's early doings. In fact, before I was really admitted to the Society, under the influence of the late Professor Graham, I undertook the translation of a paper by Redtenbacher and Liebig on 'The Atomic Weight of Carbon,' and that paper occupies eighteen pages in the first volume of the Society's 'Memoirs.' I should say that, less than a fortnight ago, I received a letter from Lady Playfair, just before she left to visit her friends in America, in which she said with what interest he had looked forward to being present at the banquet appointed for June—but that was not to be. I first made the acquaintance of Playfair in Liebig's Laboratory at Giessen, the year before the establishment of this Society, that is, in 1840. Playfair was at that time very busily occupied in translating the memorable work of Liebig, 'Organic Chemistry in its Applications to Agriculture and Physiology'; and before the session was over he left for this country with Liebig, who was to present the substance of that work as a report to the British Association at Glasgow in September. You may be interested to know who there were from this country in Liebig's laboratory at that time. Besides Playfair and myself, there were Dr. William Allen Miller, afterwards professor of chemistry at King's College; Dr. Stenhouse, who has contributed so much to the *Journal* of this Society; Dr. Angus Smith; and, lastly, Dr. Edward Schunck. He and I are, I believe, the only survivors of that time among those from England who were with Liebig then. Of the Germans who were there, some of the names you will probably remember. There were Heinrich Will, Varrentrapp, Redtenbacher, Hermann Kopp, Scherer, Bromeis, Boeckmann, and others, of various nationalities; but I believe that not one of these survives at present. Schunck joined the Society early in 1842, and he from that time to this has devoted himself to scientific investigation. He built a laboratory, and a museum devoted especially to specimens of organic bodies, in his own grounds on the other side of Manchester, where he still lives. He was, in fact, the oldest member of the Society, I believe, except Playfair and myself. He has worked indefatigably ever since; but I am very sorry to say he is not able to be here to-night, having had an attack of bronchitis, which renders it impossible, though it would have given him great pleasure to be present. Referring to that time at Giessen, I may say that Playfair, Stenhouse, and myself, each took our degree then; and Playfair, though joining with us, having gone with Liebig, the responsibility was left with Stenhouse and myself to give the usual supper to the other students of the laboratory, and a few distinguished guests, among whom was Bunsen, who was then at Marburg; and who, I am glad to learn from Sir Henry Roscoe, is still well. Stenhouse was much my senior. We had a large and lively party, but Stenhouse did not enjoy that sort of thing very much, and when the last bottle of champagne was opened, he said: 'Now, Gilbert, I shall leave you to it,' and away he went. That was, however, not near the end of the evening. They stayed a very long time, and we did not exchange the smoky atmosphere of the supper-room for the clearer air outside until early morning. We then went round the boulevards of the little town, the Germans singing students' songs, and coming in time to the hotel where Stenhouse lodged, we serenaded him from the outside. Then some one tried the door, and finding it unfastened, the whole party went up, lighted candles, and serenaded him in bed. Next morning there was a very capital caricature brought out, showing Stenhouse's rather long nose pointing in one direction, and his longer nightcap in the other. But this is enough of this kind of history, and I must now turn to rather more serious matters. It was in 1843 that I became associated with Mr. (now Sir John) Lawes in agricultural investigation—a collaboration which has now extended over more than fifty-five years. As you all know, however rude may be some of the methods of the art of agriculture, the investigation of the principles underlying its practices involves a wide range of scientific inquiry. It involves the chemistry of the atmosphere, of the soil, of vegetation, and of animal life and growth. That is to say, besides chemistry, it involves meteorology, botany, vegetable physiology, and animal physiology, to some extent. It is impossible to be a specialist in so many subjects, particularly in these days, and I can only say that in venturing to deal with these other branches of science we have taken great care to avoid mistakes. The wide range of the investigations must be accepted as some explanation of the fact that we have not contributed more of the results to the Chemical Society. Many of them being connected largely with other branches of science, have been recorded in other than purely chemical journals; whilst those having a more directly practical bearing have been published in the *Journal* of the Royal Agricultural Society, or in other agricultural publications—the Rothamsted papers now numbering considerably more than 100. But we feel that, however long or short may be the time that we shall still work

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